Weller®

WHA 3000V Hot Air Station

Operating Instructions

Version 2.3

COOPER Hand Tools

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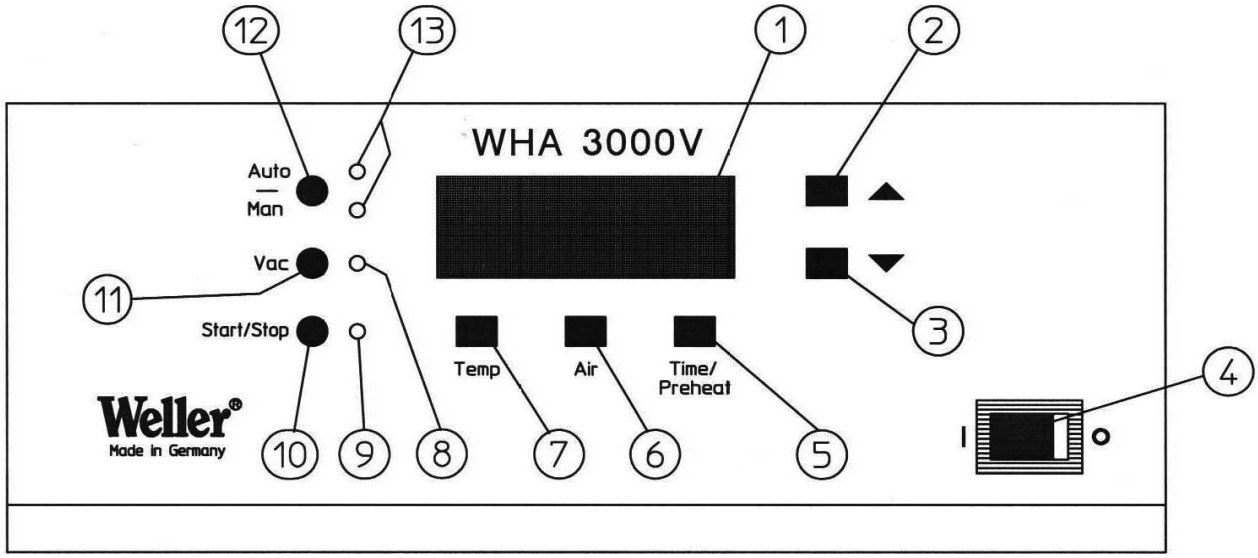

Front view WHA3000V

1 LCD Display
2 "**UP**" Control key
3 "**DOWN**" Control key
4 Mains Switch
5 "**TIME**"/"**PREHEAT**" Control key (time specification auto. mode / preheating temperature)
6 "**AIR**" Control key (air volume)
7 "**TEMP**" Control key (hot air temperature)
8 LED Indicator, Vacuum
9 LED Indicator START / STOP
10 "**START / STOP**" Control key
11 "**VAC**" Control key (activate Vacuum)
12 "**AUTO**" – "**MAN**" Control key (changeover from Automatic – Manual operating mode)
13 LED Indicators AUTO-MAN operating mode

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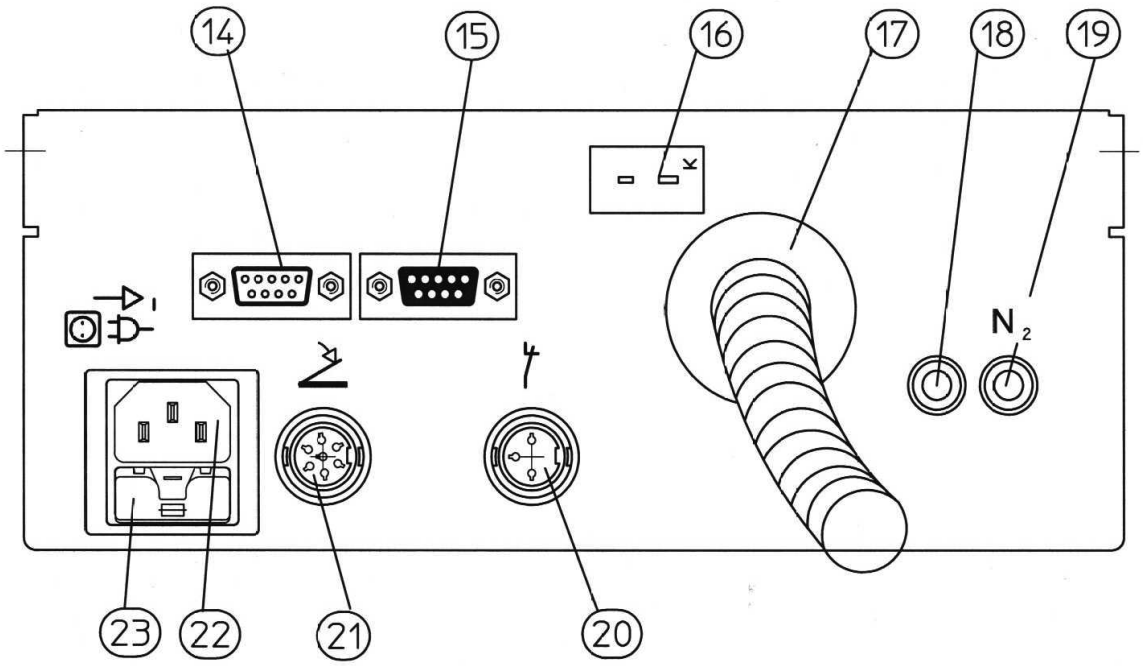

Rear view WHA3000V

14 Connection WHP3000 (bottom heater) interface RS232 Interface
15 PC Interface, RS232
16 Connection for External Sensor Type K
17 Hand- piece Connecting Hose
18 Connection for Compressed air
19 Connection for Nitrogen N2 400- 600k Pa
20 Stand Switch Connection
21 Connection for Manual Control Console; Foot Switch
22 Mains Connection
23 Mains Fuse

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We thank you for the confidence you have shown by purchasing the **Weller WHA3000V Hot Air Station**. During manufacturing, the strictest quality requirements are applied; these assure the correct function of the device and make it possible to obtain optimal soldering results.

Warning!

Prior to placing the device in operation, please carefully read these operating instructions and the safety instructions enclosed. If the safety instructions are not observed, there is a risk of injury.

The manufacturer accepts no liability for usage other than that described in the operating instructions or for unauthorized modifications

The WELLER WHA3000V Hot Air Station complies with the EU declaration of conformity as per the essential safety requirements in the directives 89/336/EEC and 73/23/EEC

1. Description

The Hot Air Station WHA3000V is suitable for difficult repairs on circuit boards with FINEPITCH components. A well designed tool concept makes top process security possible with user-friendly handling and technically advanced application solutions. And an extensive range of unit accessories widens the possibilities for use of this repair station.

The hot air temperature at the hand-piece can be adjusted within the range of 50°C – 550°C (122°F – 999°F). Through an external compressed air supply (or nitrogen N2 as an option), an adjustable air flow rate in the range from 5 l/min – 50 l/min. The hot air temperature and air flow rate are digitally controlled.

The vacuum necessary for lifting the component is integrated into the nozzle system and can be activated to suit the operating mode chosen. Two operating modes are provided:

A The "Manual“ operating mode (MAN) can be used for manual work at the hot air temperature and air flow rate set. Hot air and vacuum can be activated using the foot switch, manual remote control console or directly on the control Panel.

B The "Automatic“ operating mode (AUTO) establishes a program with a 3-step time/ temperature profile, and can be used in conjunction with the WHP3000 Pre-Heat Plate available as an accessory.

The parameters for hot air temperature, air flow rate, temperature of the optional WHP3000 Pre-Heat Plate and vacuum function can be adjusted separately and can be saved as a Rework Profile for the specific application.

The repair station can also be complemented with the optional matched WBH3000S Circuit Board Holder for X-Y alignment and a stand with Z-axis guide for the hot air hand-piece.

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Technical data

Dimensions (W x L x H)	: 240 (9.44) X 270 (10.63) X 101 (3,97) mm (inches)
Mains/line voltage	: 230 V (120 V) AC
Power input	: 475 W
Air volume	: 5 – 50 l/min.
Temperature range	: 50°C – 550°C
Accuracy	: + - 30°C (+ - 54°F)
Vacuum	: 0.6 bar
Compressed air connection	: 400 - 600 kPa
Main fusing	: 230 V / T3,15 A (120 V / T6,3 A)
Protection class	: 1 (control unit and handpiece hard grounded)

2. Placing in operation

Place the hand-piece with the hot air nozzle installed in the safety stand AKT 30. (Without the safety stand or optional WBH30000S Circuit Board Holder the unit cannot be placed in operation.)

For operation of the WHA 3000V, clean, dry compressed air or, alternatively, nitrogen N_2 is required. The compressed air connections (18, 19) are on the rear side of the unit. For connection of the compressed air supply, a compressed air hose with an outside diameter of 6 mm, which is suitable for operating pressure, is required.

The nitrogen connection (19) serves to generate hot air.
The compressed air connection (18) serves to generate vacuum by means of a compressed air converter.

If a separate nitrogen supply is not used, the compressed air connections (18) and (19) can be linked to the Y-connector and supplied with normal compressed air.

Plug cable from safety stand or optional WBH3000S Circuit Board Holder (proximity switch), into socket (20). Check whether the mains voltage matches the information on the rating plate. If the mains voltage is correct, connect the controller to the mains. When the device is switched on, the device name **"WHA3000"** and the software **"Version"** are displayed briefly. The electronics then switch automatically to the default setting (Manual operating mode).

2.1 Manual operating mode

Information on the display(1)

	TEMP	AIR	PREHEAT
	350 °C	25 l	OFF

Factory setting

Nozzle Temp. in °C — Air Flow Rate in l/min — Nozzle Pre Heating ON/OFF

In the Manual operating mode, the parameters for nozzle temperature, air flow rate and Switching on or off the pre- heating can be set.

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Selection of parameters by pressing button:

- **TEMP** (7) : Nozzle temperature in °C/°F
  (See Switching Temperature Conversation page 12)

- **AIR** (6) : Air flow rate in l/min

- **TIME/**
  PREHEAT (5) : Switch **ON-OFF** the nozzle preheating (standby) at 200°C (392°F)
  with 5 l/min airflow.

After selection, the setting can be changed using the **UP** (2) or **DOWN** (3) Control Keys. Keeping the Control Key depressed, rapidly changes the values.

The hot air and the nozzle vacuum can activated:

Directly on the Control Panel:	Hot air button **START/STOP** Control Key (10), Vacuum **VAC** Control Key (11)
2-Position Foot Switch (21):	Hot air-Position 1, Vacuum- Position 2 (hot air and vacuum are only active in the Manual Mode, when the Foot Switch is depressed)
Manual Control Console (21):	Hot air **"AIR"** Control Key, Vacuum **"VAC"** Control Key

When the hand-piece is placed in the AKT30 Safety Stand (20), the hot air is switched off by a Mirco Switch. If the nozzle pre-heating is active (PREHEAT ON), the device switches to the standby mode with reduced temperature and air flow rate (200°C/392°F-5l/min).

Note: Hot air is automatically disabled after 999 sec for safety reasons.

2.2 Automatic operating mode

The Automatic operating mode has a 3-step temperature-time profile.
The temperature-time profile can be expanded by connecting an optional WHP3000 bottom heater. When the WHP3000 is connected via the RS232 interface (14) the bottom heater is integrated into the time profile.

The temperature profile is comprised of the following 3-steps:

Pre-heat phase, system	Step 1	(ends with an audible tone)
Pre-heat phase, component	Step 2	
Reflow process (soldering)	Step 3	

The soldering process is normally started with the hot gas nozzle raised. At the end of step 1 there is an audible tone, after this tone the nozzle should be placed over the component in the soldering position. At the end of Step 3, raise or remove the nozzle from the application.

The following pre-settings must be made on the WHA3000V controller to define a customer-specific temperature-time profile.

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Settings step 1 – step 3

Nozzle temperature	50°C – 550°C (150°F / 999°F)
Temperature, bottom heat	50°C – 400°C (150°F / 750°F) (optional with WHP3000)
Air flow rate	5 l/min – 50 l/min
Time for the program step	0 sec. – 999 sec.

The Automatic operating mode can be selected by pressing the **AUTO/MAN** Control Key. The light emitting diodes (LED's) (13) indicate the related operating state.

Information on the display (1)

		TEMP	AIR	TIME	
Nozzle		210°C	40 l	100s	step 1
Pre-Heater		300°C	25 l	50s	step 2
Nozzle		210°C	30 l	15s	step 3

Nozzle or bottom heater symbol

Temperature of the nozzle or bottom heater (with WHP3000)

Air flow rate in l/min

Time remaining for the temperature profile step in sec.

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2.3 Setting temperature profile
Select the parameters by pressing the Control Key:

- **TEMP** (7): Depressed Once — Nozzle temperature during the first step
  Depressed Twice — Temperature of the bottom heater during the first step (only with WHP3000)

  ↓ Repeat for Steps 1-3

Symbol for nozzle or bottom heater indicates which temperature is displayed.

- **AIR** (6): Depressed Once: Air flow rate in l/min during the first step

  ↓ Repeat for Steps 1-3

- **TIME/ PREHEAT** (5) : Depressed Once: time remaining in the first step

  ↓ Repeat for Steps 1-3

The active value is marked on the display and can be changed using the **UP / DOWN** (2) / (3) Control Keys. Keeping the Control Key depressed, rapidly changes the value.

2.4 Starting program
The soldering process and thus the 3-step temperature-time profile is started:

Directly on the Control Panel:	**START/STOP** (10) Control Key, LED (9) illuminates.
2-Position Foot Switch (21):	**START/STOP** corresponds to setting 1 of the foot switch (hot air and vacuum are only active when pressed) Foot Switch Position 1-Air, Position 2-Vacuum
Manual Control Console (21): (Optional)	**START/STOP** using the **AIR** Control Key

The nozzle temperature, air flow rate and the time remaining are indicated on the display (1). The active program step is marked on the display.

When the hand-piece is placed in the safety stand, the program is interrupted and the hot air switched off by an integrated contact. When the nozzle pre-heating is active (PREHEAT ON), the device switches to the standby mode with reduced temperature and air flow rate.

Note: When using the WBH3000S Circuit Board Holder (20), the WHA3000V will automatically turn "off" if the position of the Z-axis Head is moved from the "Locked" center position. It must remain in position directly over the Hot Plate to allow for the WHA3000V to operate.

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2.5 Control of the vacuum function

The nozzle vacuum are activated:

Directly on the Control Panel:	**VAC** (11) Control Key, LED (8) illuminates.
2-Position Foot Switch (21):	vacuum corresponds to Position 2 of the foot switch
Manual Control Console (21): (Optional)	using the VAC Control Key

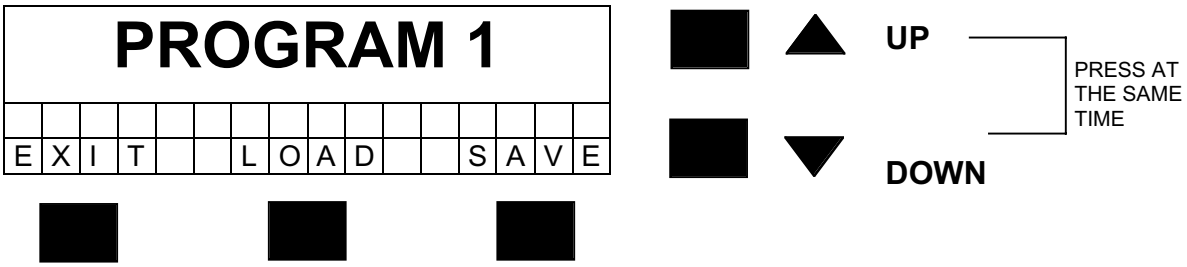
If the **VAC** Control Key (11) is pressed prior to the start of a de-soldering process, the vacuum integrated into the nozzle is activated automatically at the end of the process. The vacuum function can also be enabled and disabled manually at any time during the soldering process. If the vacuum is enabled during a soldering process, there is no automatic activation at the end of the process.

Note: If the nozzle temperature is above 250°C/482°F the vacuum is automatically disabled after 90 sec for safety reasons.

2.6 Saving and loading temperature-time profiles

A total of 10 temperature-time profiles can be saved. A default profile is saved in the 10 program memories in the factory.

Press **UP/DOWN** Control Keys (2)/(3) simultaneously until the following menu appears on the display (1)



The program memories 1 - 10 can be selected using the **UP/DOWN** Control Keys (2)/(3).

The preferred program can be selected by pressing the **LOAD** Control Key (6).
The indication on the display changes to the automatic mode and displays the selected parameters.

If a temperature-profile has been prepared, it can be saved in the selected program memory by pressing the **SAVE** Control Key (5).

The menu can be exited without saving any changes using the **EXIT** Control Key (7).

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3. External Sensor

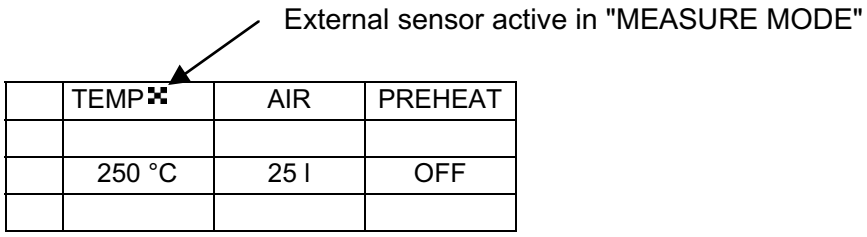
When using an external sensor (Thermocouple Type K), two different operating modes are available. By pressing the Control Key "**TIME**" / "**PREHEAT**" (5) when switching on the unit (4), you can toggle between the operating modes "**MEASURE MODE**" and "**CONTROL MODE**". The following appears briefly in the display (1):

THERMOCOUPLE MEASURE MODE	or	THERMOCOUPLE CONTROL MODE

Both operating modes only become active once the external sensor (16) has been connected.

3.1 External Sensor with measuring function "MEASURE MODE" (factory setting)

In this operating mode, the external sensor only has a measuring function. The temperature of the external sensor is shown in the display (1). The Hot Air Tool temperature control regulates the setpoint value for the nozzle temperature.

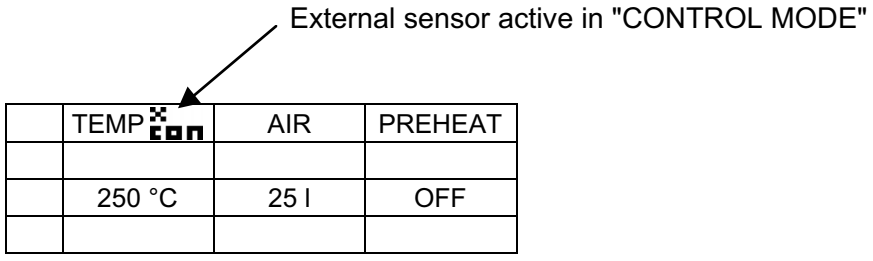


3.2 Teach In Mode procedure

During the sequence of an automatic temperature-time profile, it is possible to continue switching the process stages 1-3 manually by pressing the Control Key "**TIME**" / "**PREHEAT**" (5). If the external sensor is suitably positioned on the assembly or component, its temperature can be monitored during the entire process sequence and can be continued to be switched when the desired specified temperatures (stage 1-3) have been reached. The times determined in this manner are shown after the soldering or desoldering process in the display (1) and can be saved.

3.3 External sensor with control function "CONTROL MODE"

The temperature of the external sensor is controlled in this operating mode. The external sensor records the actual value (control variable) for the temperature control. The setting for the setpoint value at the unit must therefore be adapted to the measured temperature (actual value) of the external sensor. The actual value of the external sensor is shown in the display (1).



A basic prerequisite for faultless application is direct contact of the sensor on the assembly or component.

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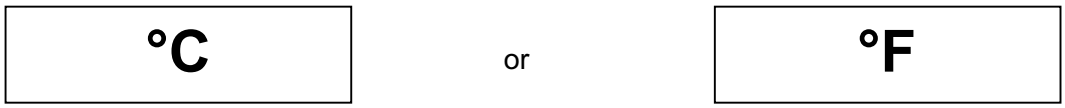
4. Lock Mode

The device can be locked by inserting and removing a coded plug in socket (21). The current soldering parameters cannot be further changed. The WHA3000P can only be operated using the START/STOP (10) and VAC (11) Control Keys.

5. Switching Temperature Conversion

By pressing the Control Key "**Temp**" (7) when switching on the unit (4), you can toggle between the operating modes "**°C**" and "**°F**". The following appears briefly in the display (1):



6. RS232 interface

Using additional software, the device can be operated completely via the RS232 interface (21).

7. Work instructions

The hot air nozzle is designed such that the vacuum plate lies flat on the component. The vacuum plate is also used for the transfer of heat. When the vacuum is enabled, the component can be lifted after the solder has reflowed. Here it is important to pre-heat the vacuum plate to operating temperature prior to de-soldering. As an option, it is possible to use a vacuum cup in place of the vacuum plate.

Nozzle change

Caution: Risk of burns! The hot air nozzle remains hot for some time after power off or removal.

The hot air nozzles are fastened to the heating element using a clamping screw. To change the nozzle, loosen the screw and remove the hot gas nozzle using the Nozzle Change Tool provided.

Use of nitrogen

The use of nitrogen N_2 reduces oxidation and the flux is active for a longer period. Nitrogen is available in steel cylinders at regular trade outlets. The cylinder must be equipped with a pressure reducer 0 – 10 bar.

Caution!: Ensure adequate room ventilation when using nitrogen.

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8. Error messages

Error	Description	Rectification
ERROR 75	Offset entry on heating element change incorrect	Repeat process
ERROR 76	Heating element faulty	Replace heating element
ERROR 110	WHP3000 housing temperature exceeded	Allow to cool down
REMOTE	Input inhibited (can only be operated using PC)	Operate using PC
LOCKED	WHA locked (lock function)	Unlock WHA
TOOL STAND	AKT30 Stand (or WBH3000 Proximity Sensor) not connected	Connect to socket (20)

9. Accessories

0053119099	External sensor type K ∅ 0.5mm
0058754951	External sensor type K ∅ 0.25mm
0058757770	Foot switch
0058736780	Manual Control Console
0051504899	Stand for six hot air nozzles
WBH3000	Circuit board holder
WBH3000S	Circuit board holder with hot air tool stand
WHP3000	Bottom heating plate

10. Items supplied

WHA3000V Controller with hand-piece
AKT30 Safety stand
0051504999 Nozzle exchange tool
Coded plug
Tool kit (2,5 mm hex wrench w/2 3 mm x 6 mm L screws provided)
0058750721 Hot air nozzle NQ30
Main power cord 120VAC
0058757770 Foot switch (only USA Version)
Product CD-Rom (Operating instructions incl. WHA control software)

Subject to technical change without notice!

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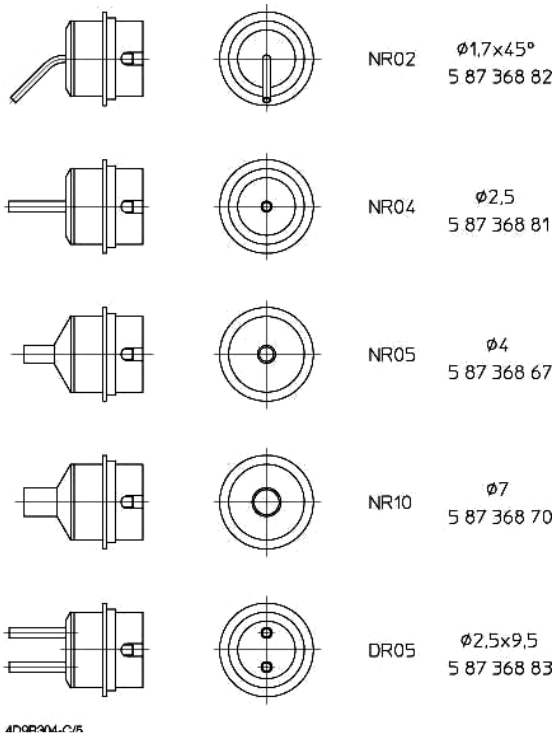
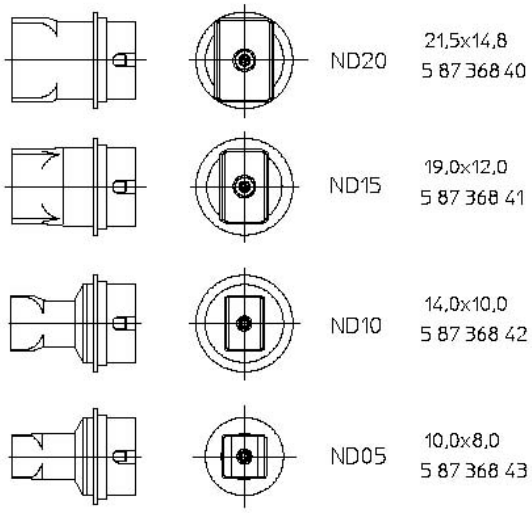
11. Hot Air Nozzles

Hot Air Nozzles for HAP 3

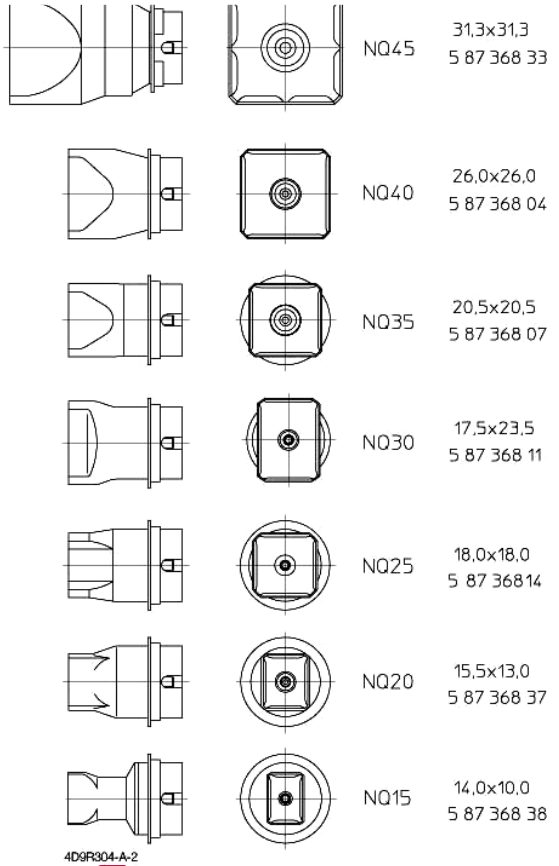
Round Nozzles



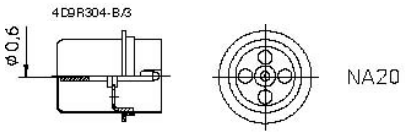
Hot air nozzles 2-sides heated (Type ND)



Hot air nozzles 4-sides heated (Type NQ))



Measuring nozzle 005 87 368 75



005 87 368 39 NQT Hot air nozzle 22,0 x 22,0 mm
005 87 368 41 NQT10 Hot air nozzle 14,8 x 14,8 mm
005 87 368 42 NQT25 Hot air nozzle 18,0 x 18,0 mm
005 87 368 43 NQT Hot air nozzle 16,0 x 16,0 mm

4D9R304-A-2

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12. Quick Reference WHA3000P/V

- Changeover
  auto-manual operating mode

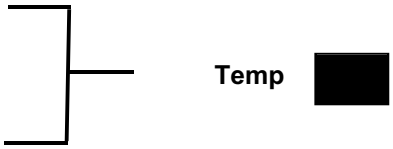
- UP Control Key increase value

- DOWN Control Key decrease value

- Activating vacuum function

- Start/Stop soldering process
  Respectively hot air function

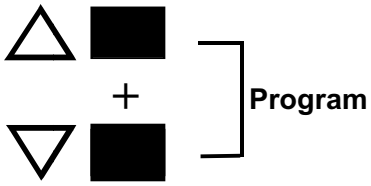
- Setting hot air temperature
  (manual mode)
- Setting hot air temperature and
  bottom heater for step 1 – 3
  (auto mode)



- Setting flow rate
  (manual mode)
- setting flow rate for step 1 – 3
  (auto mode)

- Time setting for step 1 – 3
  (auto mode)
- Nozzle preheating ON/Off
  (manual mode)

- Save and load program
  for temperature profiling



- Switching Temperature Conversion
  (Pressing when switching on the WHA3000P)

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